

CRU Prices

Mixed Hydroxide
Precipitate (MHP)
Methodology and
Definitions Guide

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Methodology and Definitions Guide – Mixed Hydroxide Precipitate

1 Scope

This guide covers commodity produce prices in all relevant geographical markets and should be read in conjunction with the [CRU Group Compliance Framework and Methodology Guide](#). It details commodity-specific methodology, which has precedence, with all other aspects covered by the Group methodology guide.

2 Methodology

CRU assesses prices for physically traded Mixed Hydroxide Precipitate (MHP) in the relevant global markets that are outlined in the following methodology guide. This methodology, which was developed in consultation with the industry (including through our annual Underlying Market Conditions Review), allows CRU to capture market liquidity and establish prices that are reliable and representative of the market. Specification definitions such as price assessment frequency, incoterms, currencies, size/volumes, units and others are aligned with MHP market requirements and industry conventions.

This methodology prioritises transaction prices and other methodological rules with limited but necessary application of expert judgement, detailed below, to produce a price assessment that benefits from rigour, and Price Assessor expertise and discretion in equal measure.

MHP prices are determined as a range because the collected data tends to be more widely distributed. A range is therefore better suited to reflect the wider spread of data. Prices are displayed as a point for monthly averages for use in long term contracts.

Data Providers

CRU price assessments are based on regular contact with a wide a network of market participants situated at critical nodes in the supply chain. This network is constantly reviewed to seek a balance of buyers and sellers that are representative of the market.

They must have access to data relating to actual spot market transactions (a purchase or a sale), bid/offer information or be able to provide a credible opinion on such prices in the absence of any other data over the relevant time period. They are therefore typically employed in sales or marketing functions on the sell side and purchasing functions on the buy side, or act in a trading function. Data Providers may also include individuals in finance functions if they can provide the same.

Each data provider is required to meet the criteria stipulated in Section 2.4 of the *CRU Group Compliance Framework and Methodology Guide*.

Data Submitted and Submission Processes

Any price data provided to CRU must meet the relevant product definitions. Price assessments are based on regular contact with a wide a network of market participants situated at critical nodes in the supply chain. This network is constantly reviewed to seek a balance of buyers and sellers that are representative of the market.

Data providers are to provide CRU with price data relating to sales or purchases concluded in a transaction window between 14:00 Beijing time on the Friday of the week prior to publication and 14:00 Beijing time on the first Thursday of the month, or other price information relating to this time period. Transaction data is prioritised as an input and to that extent the hierarchy of acceptable price types follows that described in Section 2.1 of the *CRU Group Compliance Framework and Methodology Guide*.

In the absence of actual transaction data, data providers can give firm/indicative bids or offers, and opinion of the prevailing market price in the same period.

Industry participants can submit prices to CRU by telephone, email, private one-to-one instant messenger services or other private means of communication.

Data Submission Dependency And Minimum Threshold

CRU seeks to receive market data information from the broadest range of active data sources as possible and seeks to increase the number of companies willing to submit market data. In the event that a limited number of market participants are active in the market, and the market data received constitutes a significant proportion of the total data on which is the assessment is based, CRU will use expert judgement on whether to exclude, or include or defer the indication received until more information is received. This would be based on: observation of the previous price; short term historical price trends; other quantitative market

data including prices in other related active markets, producer price change announcements; qualitative information such as that received from interactions with market participants or other CRU Price Assessors, and; other sources of information relevant to the market.

CRU does not outline minimum data thresholds to determine MHP price assessments to avoid establishing non-representative assessments that may be deemed unrepeatable. Periods of liquidity differ across the market and data thresholds could result in price assessments that do not accurately reflect the market. Price assessors, instead, aim to source data from a wide range of industry participants to establish MHP price assessments, in line with the individual price's market data specifications, such as size, timing, loading locations outlined in this methodology.

When no admissible data is received, price assessors follow the processes set out in the "Price determination in an illiquid market" section and expert judgement would be used to determine the final price value. Further details can be found under Section 2.1 of the *CRU Group Compliance Framework and Methodology Guide*.

Final Price Assessment

Final Assessment Calculation Process

The high and low values of the published price range are established as follows:

1. All data points submitted are assessed against admissibility criteria in the relevant product specification and the criteria stated in this methodology.
 - a. Data points which meet the criteria without normalisation are determined as admissible.
 - b. Data points that require normalisation and can be normalised are normalised, and the resulting data determined as admissible.
 - c. All other data points are rejected as inadmissible and will not be used in subsequent price evaluation.
 - d. Of the data points that remain, outliers (defined above) may also be rejected as inadmissible if they otherwise do not meet acceptability criteria.
2. Expert judgement is used to establish the high and low values of the published price range by reference to the distribution of admissible data points around the mid-point and values of the lowest and highest data admissible points, in the current and prior assessment periods. Metrics such as the standard deviation may be used as a guide to this process, but not as a sole determinant of the range. This means the high and low of the published range are not necessarily set equal to the highest and lowest admissible data points because to do so would:
 - a. Introduce excessive volatility in the high and low of the published range over time
 - b. Define the range by individual deals which may carry little volume weight and ignore other admissible data points.

Normalisation

The final price is assessed based on all data received by all permissible means. Data which meet the precise definitions below are eligible for admission without any transformation. Data which do not will be subject to a normalisation process in order to adjust for delivery basis etc.

Expert judgement and exclusion of outliers

Expert judgement may apply to decisions on whether price data submitted relate to actual deals concluded, if normalisation of price data submitted is required and the means of any normalisation, and the inclusion of a data point in calculation of the final price. A Price Assessor will consult with one or more colleagues before any application of expert judgement if in any doubt or where collective input would improve the quality of a judgement. Consistency in the application of expert judgement is achieved through a combination of selection, formal and informal training and review, supervision and control processes as detailed in section 4.5 of the *CRU Group Compliance Framework and Methodology Guide*.

A Price Assessor may use expert judgement in the exclusion of a data point as an input to the calculation of the final price. In doing so they would consider: the range and distribution of data collected in the same timeframe from other data providers; previous data received from the same data provider; non-price information received from the data provider; market state and direction information from any other source. Inclusion or exclusion of input data in the final price is explicit and recorded.

Price determination in an illiquid market

In the case of no qualifying data points, an illiquid market or zero submissions, where submissions, if any, were deemed inadmissible or otherwise where received data is judged insufficient, expert judgement would be used to determine the final benchmark values.

This choice would be based on: observation of the previous price; short term historical price trends; other quantitative market data including prices in other related active markets, producer price change announcements; qualitative information such as that received from interactions with market participants or other CRU Price Assessors, and; other sources of information relevant to the spot market.

The price assessor will use their judgement to evaluate the volume, quality and coherence of any such market information they may possess. If one or more of these factors in combination does not provide a sufficiently clear indication of the direction and extent of market movement to allow the price assessor to confidently change the benchmark from the previous value, the prior value would be rolled over to form the current period value.

Deactivated Prices

A price assessment will remain active as long as there are sufficient buyers, sellers and/or traders for the Price Assessor to make an accurate assessment. If the quotation suffers from limited transparency or if business dynamics change, it may be deactivated following market consultation. Its history will still be available, but no further information will be collected for that assessment from the time it is deactivated.

Price Verification

Information from data providers and the final price assessments are captured and established in the CRU's Prices System (CPS). The final prices are approved by another Price Assessor or the editor.

Final Benchmark Publication

CRU MHP prices are published in the *CRU Nickel Service*, via CRU Online; data feeds including APIs; and DataLab (CRU's data delivery platform).

Prices are first published on CRU Online on the first Thursday of the month.

3 Definitions

Mixed Hydroxide Precipitate, China 30-40% Ni, 1-6% Co, CIF

DataLab Name:	Mixed Hydroxide Precipitate, 30-40% Ni, 1-6% Co, Spot price; China, CIF
Grade:	30-40% Ni, 1-6% Co
Price basis:	CIF China
Credit/Payment terms:	Bank acceptance (other payment
normalized) Loading Location:	Producer plant
Type:	Spot - Assessed
Unit:	% of LME nickel price
Size:	Min lot size 100t Ni metal
Timing:	No more than 4 weeks forward
Main Consumer Markets:	China
Pricing:	Business reported by sellers to buyers – no inter-trade activity
Duties/Tariffs:	VAT included; any other duties excluded
Frequency:	Monthly, first day of month

Glossary of Abbreviations

INCO TERM RULES FOR ANY MODE OR MODES OF TRANSPORT:

EXW – Ex-Works
FCA – Free Carrier
CPT – Carriage Paid To
CIP – Carriage and Insurance Paid To
DAT – Delivered at Terminal
DAP – Delivered at Place
DDP – Delivered – Duty paid

INCO TERM RULES FOR SEA AND INLAND WATERWAY TRANSPORT:

FAS – Free Alongside Ship
FOB – Free On Board
CFR – Cost and Freight
CIF – Cost Insurance and Freight

COUNTRY ABBREVIATIONS USED:

We use ISO 3166 alpha-2 standard country codes